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Polar Colonization. The Preliminary Arctic Expedition of 1877. Washington, D. C. 8vo, pp. 32.

Immortality. All Life conditionally Immortal. By William Bross. Chicago: Jansen, McClurg & Co. 8vo, pp. 8.

The Geological Formations of La Salle county, and their Organic Remains. By William W. Calkins. 12mo, pp. 11.

Recent Investigations of Embryologists. By Charles Sedgwick Minot. (From the Proceedings of the Boston Society of Natural History, xix.) 8vo, pp. 7.

Report on the present state of our knowledge of the Crustacea. Part i, ii. On the Homologies of the Dermal Skeleton. By C. Spence Bate. (From the Report of the British Association for the Advancement of Science for 1875, 1876.) 8vo, pp. 12, 20.

Geology of Wisconsin, Surveys of 1873-1877; Vol. II. Part I, Historical; II, Eastern Wisconsin; III, Central Wisconsin; IV, Lead Region. Accompanied by an atlas of maps. Published under the direction of the Chief Geologist, T. C. Chamberlin, by the State Commissioners of Public Printing, Madison, Wis. 1877. 8vo, pp. 768.

Palæontological Bulletin, No. 28. On new Vertebrata from the Upper Tertiaries of the West. On new Saurians discovered by Mr. Wheatley in the Trias of Pennsylvania. On the Vertebrata of the Dakota Epoch of Colorado. By E. D. Cope. (Read before the American Philosophical Society, December 21, 1877.) 8vo, pp. 28.

Bulletin of the Buffalo Society of Natural Sciences; Vol III. Buffalo. From April, 1875, to August, 1877. 8vo, pp. 230.

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GENERAL NOTES.

BOTANY.

LAVALÉE'S ARBORETUM SEGREZIANUM.¹—This is a handsome volume of some 500 pages, containing a catalogue of the trees and shrubs collected by Mons. Lavalée on his estate at Segrez, a few miles south of Paris, with their synonyms, origin, and with abundant references to the most accessible figures. In an interesting preface M. Lavalée tells us how, from a small beginning ten years ago, his collection has grown until it contains more than 3000 species and garden varieties; of the excessive labor which its formation and scientific arrangement has enjoined on him; and of the many difficulties he encountered in determining the names of the plants which he has ransacked Europe to procure. How admirably he has overcome these difficulties, difficulties which will hardly be appreciated except by those who have undertaken the formation of a large scientific collection of living plants, his pages tell.

The second portion of the preface is devoted to a by far too short historical sketch of the principal collections of exotic trees, which have been found in France from the time of René du Bellay, in the middle of the sixteenth century, down to that which Vilmorin brought together on his estate at Barres; now fortunately in possession of the State as a school of forestry.

¹ *Arboretum Segrezianum—Enumeration des Arbres et Arbrisseaux Cultivés à Segrez.* Par ALPH. LAVALÉE. (Paris: J. B. Baillière et Fils. 1877.)

In the body of the catalogue a few errors are noticeable, mistakes in the spelling of foreign name are not infrequent, and the synonymy and origin of some plants (*Rubus didicerisus* is given as a native of Canada) will require correction for another edition, from which no doubt further study will remove some of the doubtful species credited to North America. To directors of botanic gardens, or to those whose duty it is to care for such collections, the *Arboretum Segrezianum* will be an invaluable aid. A volume of plates with technical descriptions of some of the last and little known species in M. Lavalée's Arboretum is promised, and is, we believe, already in press.—*C. S. Sargent.*

RESEARCHES IN REGARD TO TRANSPIRATION IN PLANTS.—J. Wiesner has published, in *Annales des Sciences Naturelles*, an account of his experiments upon this subject. The following is a statement of his conclusions:

The effect of light upon transpiration is most obvious in the case of plants of a green color. The comparison of green and etiolated maize does not leave any room for doubt.

The functions of chlorophyll in transpiration are evident. A part of the light which traverses the chlorophyll is transformed into heat, and from this results an elevation of temperature in the tissues. Increase of tension of aqueous vapor in the intercellular space follows, and the excess of vapor passes out by the stomata.

It is therefore easy to understand how a plant can transpire in a saturated atmosphere, but only under influence of light.

These experiments were conducted in three ways: by comparing green and etiolated plants, by exposing the plant to the solar spectrum, and by placing them behind solutions of chlorophyll.

The results from these three methods agree. They show that the presence of chlorophyll appreciably augments the action of light on transpiration; that it is the rays corresponding to the absorption bands of the chlorophyll spectrum, and not the more luminous rays which excite transpiration; and finally that the rays which have passed through a solution of chlorophyll exert only a feeble influence on transpiration.

Other coloring matters, like xanthophyll for example, act like chlorophyll, but to a less degree. Wiesner does not deny that opening of the stomata may accelerate transpiration in sunlight, but the very great transpiration of maize, the stomata of which were closed, and the feeble transpiration of *Hartwegia comosa*, in which they were largely open in the dark, suffice to indicate that they are not the principal cause of transpiration in the light.

The dark heat rays act in a very appreciable manner, but less than the luminous rays. So far as the ultra-violet chemical rays are concerned their action is *nil* or exceedingly slight.

Whatever the nature of the rays, they always act by increasing the temperature of the tissues.

Wiesner concludes his paper by the statement: "The physiological end of the absorption of light is no longer a secret, and I have at the same time detected a new function of chlorophyll."—*Annales des Sciences Naturelles*, September.

To the above may be added a brief reference to a note by Déherain, in which he states that he had obtained results different from those of Wiesner, and that he is soon to criticise further Wiesner's paper.

BOTANICAL NEWS.—*Trimen's Journal of Botany* for December, besides articles of local interest, contains an interesting discussion of some questions of botanical nomenclature, by J. Ball; some contributions to plant-chemistry, by A. H. Church; notes on Japanese and Bermudian ferns, and notes on some hybrid brambles, by W. O. Focke; Julius Wiesner's work on the influence of light and radiant heat on the transpiration in plants is abstracted. The journal contains a discriminating review of Darwin's *Different Forms of Flowers on Plants of the same Species*.

The Bulletin of the Torrey Botanical Club for November and December, contains Wolle's enumeration of Fresh Water Algæ, which embraces upwards of 150 forms new to the United States, and 24 species new to science. Mr. Meehan describes the habits of *Gentiana andrewsii*. Mr. C. F. Austin describes *Danthonia faxoni* n. sp., and two new mosses, while Mr. Davenport presents a description of a new fern, *Cheilanthes viscida*, from California.

ZOÖLOGY.¹

PECULIAR FEATHERS OF THE YOUNG RUDDY DUCK.—The unusually narrow, rigid and acuminate tail-feathers which constitute a character of the genus *Erismatura* are much more peculiar at an early stage of their growth. The curious structure will doubtless be new to most readers of the NATURALIST.

The accompanying cut will give an idea of the general appearance of the feather, which is, in fact, double, one complete feather growing on the end of another, and the two being dissimilar in structure.



To the naked eye the terminal feather appears to be simply a prolongation of the shaft of the other, as a slightly swollen, stiff stem projecting an inch or more beyond the true web, and bearing upon its terminal half a bunch of loose, disconnected barbs, more or less recurved, and fringed with light fluffy barbules. With a lens this terminal portion is seen to be a distinct feather, complete in all its parts, borne upon the end of the other. It has a simple

¹ The departments of Ornithology and Mammalogy are conducted by Dr. ELLIOTT COUES, U. S. A.